The trapped bird appeared significantly warmer-coloured and less worn than the bird seen well on 24 April, suggesting that two different Black-browed Reed Warblers were present. Wing length was 51 mm and tail length 46 mm. The body plumage, coverts and tertials were little worn, imparting a relatively warm brown tone to the upperparts, suggesting that the bird had undergone a moult of some or most contour feathers during the winter. This also suggested that this was probably a different individual to the bird seen well on 24 April (which appeared greyer-brown above and whiter, less buffy below). It is assumed, therefore, that two Black-browed Reed Warblers were present (both the birds—the first glimpsed only—seen on 24 April).

In 2009 an individual was located by PDR in a patch of *Phragmites* in a water-filled ditch (c.400 m distant from the previous sightings) at c.17h00 on 16 March 2009, shortly after its short chacking calls were heard. It was in view for only a few seconds, but the distinctive head pattern and unstreaked upperparts left no doubt that it was a Black-browed Reed Warbler.

These are apparently the first records for the Philippines. The Black-browed Reed Warbler breeds widely in north-east Asia, Central Asia, northern, central and eastern China and northern Japan, and winters commonly in south-east China and in the South-East Asian mainland south to Sumatra (Robson 2000, Dickinson 2003). Written accounts of both the 2008 and 2009 sightings (photographs and full biometrics and wing formula of the bird in the hand) are filed with the Philippine Bird Records Committee.

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Counts of Steppe Eagles *Aquila nipalensis* at a carcass dump in Jorbeer, Rajasthan, India

PRADEEP SHARMA and K. S. GOPI SUNDAR

The Steppe Eagle *Aquila nipalensis* (Hodgson 1833) has an estimated global population of 100,000–1,000,000 individuals (Ferguson-Lees and Christie 2001) and is regarded as the most common wintering *Aquila* eagle in the Indian subcontinent (Naoroji 2006). In India, the species has a widespread winter distribution in the northern and central states (see Naoroji 2006). Wintering population estimates are not available, but counts of migrating flocks over the Himalayas in Himachal Pradesh (Donald 1923, ven Besten 2004) and Nepal (de Roder 1989, DeCandido *et al.* 2001, Gurung *et al.* 2004) suggest that at least thousands of eagles winter in India, and that their arrival is staggered over October–November with birds departing during February–March each year. Little is known about the wintering ecology of the species. Juveniles and adults of the Steppe Eagle are suspected to prefer different wintering locations and habitats (Naoroji 2006). Other than some observations on the migrating population in Nepal that suggest that young birds predominate in wintering areas (de Roder 1989), little is known of the age composition of the wintering population of the species. In this study we estimated the abundance of wintering Steppe Eagles every fortnight at a carcass dump in Jorbeer, western Rajasthan, India over three consecutive winters in 2003–2006. We specifically ascertained (1) numbers of individuals at the site, (2) the age composition of wintering Steppe Eagles, and (3) whether eagle counts at Jorbeer follow patterns similar to those observed during counts of migrating birds over the Himalaya.

STUDY AREA

Jorbeer is a dumping site for cattle carcasses, situated 10 km from Bikaner city, Rajasthan (Figure 1). The site is in the Thar Desert at 235 m above mean sea level, with a landscape dominated by arid, undulating sand dunes with sparse desert vegetation. The climate is dry with an average annual rainfall of 260–270 mm and temperatures

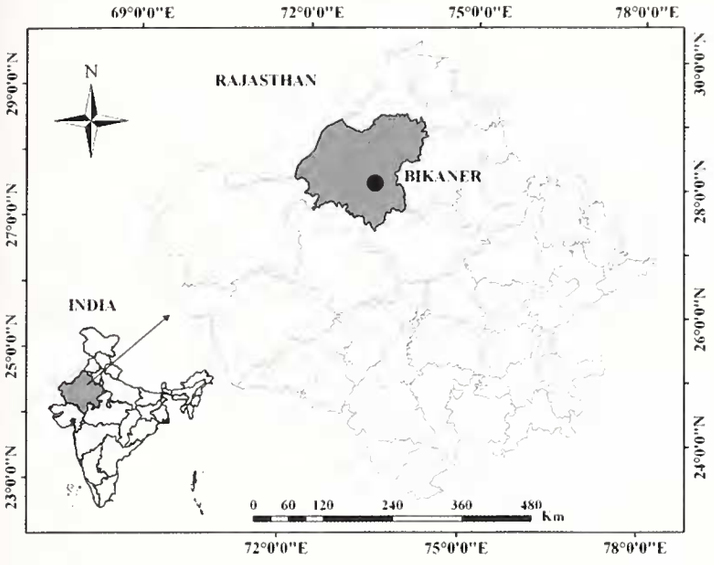

Figure 1. Map showing the location of Jorbeer (black dot) in India.

range from a minimum of 4°C in winter to a maximum of 45°C in summer. Other raptors at the site included six species of vultures (Egyptian *Neophron percnopterus*, White-rumped *Gyps bengalensis*, Long-billed *G. indicus*, Eurasian Griffon *G. fulvus*, Cinereous *Aegypius monachus*, and Red-headed *Sarcogyps calvus* Vulture), one species of resident kite, and rarer species like Imperial Eagles *Aquila heliaca*, Indian Spotted Eagles *A. hastata* and Tawny Eagles *A. rapax*. The vegetation is mainly composed of scattered trees, principally *Salvadora oleiodes*, *Azadirachta indica* and *Prosopis cineraria*, shrubs such as *Ziziphus nummularia*, and grasses such as *Lasiurus sindicus* and *Panicum antidotale*. Carcasses were mainly cattle but included camels and dogs. Approximately 15–20 carcasses were dumped each day at the site providing a regular and large source of food to scavenging birds and mammals. Some carcasses originated from veterinary colleges and hospitals, and may have contained the drug diclofenac, which has caused the rapid decline of vultures in south Asia (Green *et al.* 2004, Oaks *et al.* 2004). Stray dogs were present in varying numbers at the site. The Jorbeer dump varied in size depending on the number of carcasses dumped but largely ranged from 3 to 5 ha. Plate 1 shows an overview of the site with some raptors.

Plate 1. A view of the Jorbeer carcass dump showing various raptors. (Pradeep Sharma)

METHODS

Steppe Eagles counts were undertaken fortnightly from December 2003 to January 2006. Pre-determined routes that completely covered the carcass dump site were walked by the same two observers. Counts began at sunrise and lasted for an hour. The age of each eagle was recorded either as young (juvenile and subadult) or adult. A few Tawny Eagles may have been included in some counts, but their numbers appeared to be too low to affect population estimates. To assess whether seasonal changes in abundance were similar to previous counts in the Himalayas, cumulative counts of each 15-day period were compared. Because the Himalayan birds were counted on passage migration and the Jorbeer birds likely overwintered in Rajasthan, we assumed that, in each count period, eagles counted over the Himalayas were likely to be different individuals, while each count at Jorbeer likely represented cumulative numbers of eagles in their wintering site. We therefore compared cumulative counts in the Himalaya against simple counts at Jorbeer. Counts were plotted graphically to examine simple relationships. Although Jorbeer is expected to lie further along in the migration route of Steppe Eagles, we did not use a time-lag in these analyses because count periods were relatively large at 15 days, and the years being compared were different. Since the number of sample points are very low (3 or 4 fortnights) and years of counts are different, the comparisons are exploratory and we avoid statistical testing.

RESULTS

Steppe Eagles were observed from September to May, with the highest counts occurring from December to

Table 1. Raw fortnightly counts of Steppe Eagles at Jorbeer carcass dump (Dec 2003 to Jan 2006). A '–' indicates periods when counts were not conducted.

Count periods	Year of count 2003–04	2004–05	2005–06
1–15 Jul	–	0	0
15–31 Jul	–	0	0
1–15 Aug	–	0	0
16–31 Aug	–	0	0
1–15 Sep	–	0	2
16–30 Sep	–	9	12
1–15 Oct	–	3	5
16–31 Oct	–	9	5
1–15 Nov	–	8	28
16–30 Nov	–	17	38
1–15 Dec	28	22	46
16–31 Dec	22	49	61
1–15 Jan	26	109	81
15–31 Jan	14	113	89
1–15 Feb	27	100	–
16–28 Feb	31	136	–
1–15 Mar	33	122	–
16–31 Mar	53	79	–
1–15 Apr	30	0	–
16–30 Apr	16	0	–
1–15 May	19	0	–
16–31 May	37	0	–
1–15 Jun	0	0	–
16–30 Jun	0	0	–

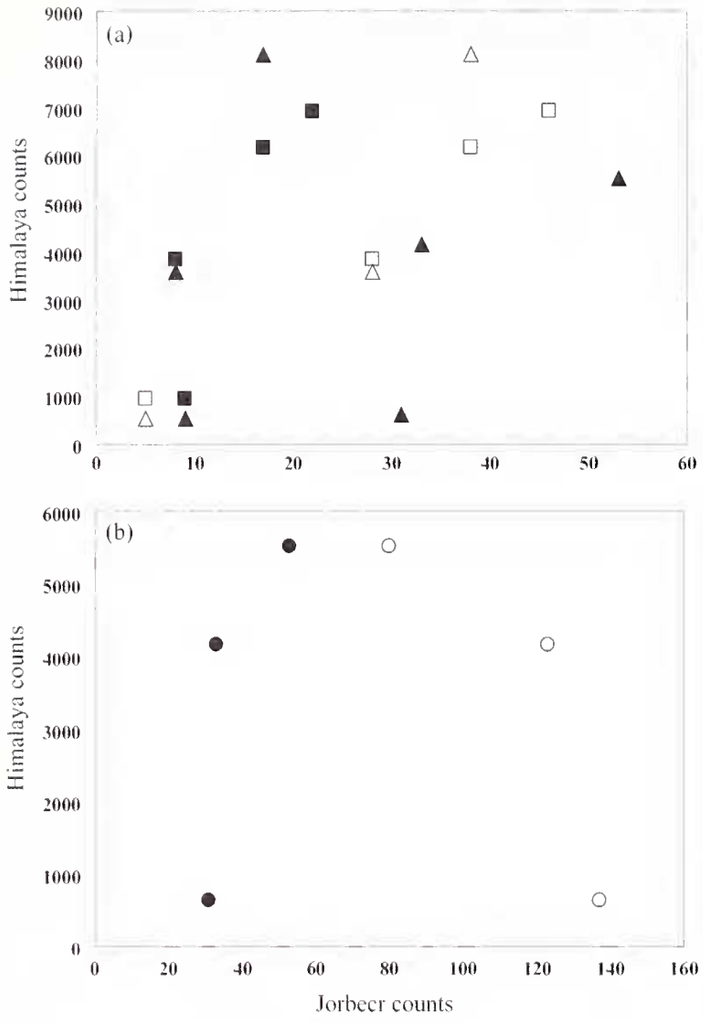

Figure 2. Correlations of Steppe Eagle counts at Jorbeer carcass dump in 2004 (closed symbols) and 2005 (open symbols) with (a) arriving patterns at Himachal Pradesh (triangle; 2001) and Nepal (square; 2003), and (b) departure patterns at Himachal Pradesh (circles; 2002). Himachal Pradesh counts are from den Besten (2004) and Nepal counts are from Gurung *et al.* (2004).

February (Table 1). All the eagles scavenged on carcasses, and there were no observations of individuals hunting or kleptoparasitising each other. Eagles perched on trees and carcasses with no apparent display of territorial behaviour. Only six adult eagles were observed during this study (two in March 2004 and 4 in February 2005) with the rest being young birds. A single dead young Steppe Eagles was observed on each of 14 December 2004, 9 December 2005 and 29 January 2005. The causes of mortality could not be ascertained. Individual counts varied widely from day to day, averaging 43 birds (± 38 SD, range: 2–136, excluding periods with no eagles). The reduced number during December 2003 to May 2004 (Table 1) was possibly due to a large number of stray dogs using the site in those months. Movements of eagles while at the site were not possible to determine, nor could we assess whether individual eagles stayed throughout the winter at Jorbeer. In years when counts covered total wintering time, eagles were seen at the site as late as May (in 2004; Table 1). Eagle counts at Jorbeer were positively related to cumulative counts of migrating eagles over the Himalaya during the autumn migration (Figure 2). Spring migration patterns were positively related in one year and negatively related in another year (Figure 2).

DISCUSSION

Naoroji (2006) reports that Steppe Eagles return to nesting areas by April, though our observations show that they stayed on in Jorbeer until late May in 2004. In 2005 however, eagles were not seen after March indicating that there are year-to-year changes in migrating or overwintering behaviour. Patterns of abundance in Jorbeer during arrival were positively related to counts of arriving birds over the Himalayas. This suggests that sites like Jorbeer with consistent supply of food for the eagles may be useful to monitor migration behaviour. Relationships during departure were positive in one year and negative in the other. This difference was possibly because departure patterns differed across years. Due to such annual variations in migration and unknown flight distances in wintering grounds, counts at individual sites will be of very limited value to determine population estimates. Multi-year, standardised counts, and synchronising effort at Himalayan and wintering locations are required to understand how well counts at wintering sites perform as population indices, and if they can be useful to determine migration behaviour.

Migrating Steppe Eagle populations in the region are dominated by young birds (de Roder 1989, Naoroji 2006), and the observations at Jorbeer corroborate this. This may be a result of adult birds choosing more optimal wintering sites (Cox 1968) – which the arid Thar Desert is unlikely to be – and also of adult birds remaining closer to their breeding sites (Naoroji 2006). Counts at wintering sites are therefore unlikely to be useful to understand the demography of Steppe Eagles.

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Status and distribution of vultures in Andhra Pradesh, India

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Gyps vultures in the Indian subcontinent and South-East Asia have declined catastrophically during the last decade, and current populations are estimated to be <5% of the original (Prakash *et al.* 2003). The major reason for these declines appears to be the use of the veterinary drug diclofenac for treating cattle (Oaks *et al.* 2004, Prakash *et al.* 2005, Swan *et al.* 2006). Conservation efforts in India have included research and captive breeding programs (Prakash *et al.* 2003, Umapathy *et al.* 2005, MoEF 2006). Most detailed studies have taken place in northern India, where vultures occurred at their highest densities in the past; less information is available from southern India. The southern Indian state of Andhra Pradesh has six species of vultures: White-backed Vulture *Gyps bengalensis*, Long-billed Vulture *G. indicus*, Indian Griffon Vulture *G. fulvus*, Egyptian Vulture *Neophron percnopterus*, King Vulture *Sarcogyps calvus* and Cinereous Vulture *Aegypius monachus* (Ali and Ripley 1983). An informal survey between 1990 and 1997 counted approximately 8,500 vultures across the state (Srinivasulu and Srinivasulu 1999). In the present study, we provide updated information on the status and distribution of vultures in Andhra Pradesh.

METHODS

We surveyed vultures across Andhra Pradesh, including all major cities, the 19 Wildlife Sanctuaries, the four National Parks, Srisailam Tiger Reserve and important reserve forests, between January and December 2007 (Table 1), using the road-transect survey method (Fuller and Mosher 1981) between 08h00 and 17h00. Road transects were run at 20–30 km/h; where roads were absent (mainly forests, but also remote villages and open land) transects were walked at c. 3km/h. Detectability may have been higher along foot transects, but we did not attempt to quantify this. Road transects were mostly on state highways and on roads running through protected areas. No transects were repeated, and adjoining transects were separated by at least 30 km. Vultures were recorded within 300 m of a transect using 10x binoculars. Encounter rates of vultures were calculated as the number of individuals sighted per km of transect.

In addition to running transects, we also visited 54 municipal, town, and village dump yards, looking for carcasses and vultures. Information on these dump yards was collected from local government offices. At least two hours in the morning (between 08h00 and 11h00 hrs) were spent searching dump yards and, whenever animal carcasses were found, a second visit was made the next day. In general, we attempted to visit sites where vultures had previously been reported. During the survey, we gave questionnaires to officers of the Forest Department (the government department responsible for wildlife conservation) as well as local wildlife biologists and naturalists. The questions focused recent vulture sightings and the availability of carcasses.

RESULTS

In total, we covered 4,670 km across 129 separate transects, which varied in length from 3 to 160 km. Of this total, road transects accounted for 4,070 km and foot transects for 603 km. In all, we saw 20 individual vultures of three species (Table 2 and Fig. 1). The two *Gyps* vultures sighted were found exclusively in forests, while the third species, Egyptian Vulture, was seen only at municipal

Table 1. Total transect length, protected areas (sanctuaries, national parks, and tiger reserve) surveyed and number of dump yards visited.

District	Total distance covered (km)	No. of protected areas surveyed	No. of dump yards visited
1. Adilabad	741	3	10
2. Hyderabad	218	2	4
3. Anantapur	209	—	3
4. Visakapatnam	174	1	2
5. Kakinada	162	1	3
6. Chittoor	387	2	3
7. Kadapa	182	2	3
8. Nellore	138	2	3
9. Warangal	411	2	4
10. Khammam	181	1	8
11. Kurnool	1,593	2	6
12. Medak	274	2	5